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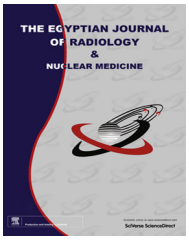

ORIGINAL ARTICLE

Factors affecting patients' satisfaction in nuclear medicine department in Egypt

Maged Abdel Galil Hamed [a,*], **Ghada Mohammed Salem** [b]

[a] *Lecturer of radiodiagnosis, Faculty of Medicine, Zagazig University, Zagazig, Egypt*
[b] *Lecturer of community medicine, Faculty of Medicine, Zagazig University, Zagazig, Egypt*

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KEYWORDS

Nuclear medicine department;
Patients' satisfaction;
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Abstract *Background:* Nuclear medicine is one of the most dynamic areas of medicine with continual technological innovations and developments of new radiotracers. Patient care is an important duty of any health care personnel. Measuring patient satisfaction is considered as a key dimension of health care quality.
The purpose of this study is to assess quality of care and patients' satisfaction in the nuclear medicine department at Al-Ahrare Hospital-Zagazig, Egypt.
Subjects and methods: A cross sectional study was performed at the nuclear medicine department to measure patients' satisfaction to the service introduced at the hospital. Questionnaire was adapted from National Health Service of the UK and was used to evaluate patients' satisfaction during attendance to the department.
Results: It was found that the gender and level of the education of the studied sample were statistically significant (P value < 0.05) affect their general satisfaction of the nuclear medicine department & recommendation the department to the others. Also questions about the informed waiting time, information before examination, noise in department, cleanliness of the department, waiting time to appointment and conflict of information were taken the highest percentage in the patients' dissatisfaction.
Conclusions: Patients' satisfaction was high in perceiving the infrastructure of the department while waiting time and giving information before examination were the least satisfied to the patients.

1. Introduction

Nuclear medicine is one of the most dynamic areas of medicine with continual technological innovations and developments of new radiotracers. The International Atomic Energy Agency (IAEA) defines nuclear medicine as a medical specialty that uses techniques with high cost-benefit index to obtain functional and anatomical information, constituting a tool for the detection, staging, treatment, prognosis and monitoring

* Corresponding author.
E-mail address: magedbox@yahoo.com (M.A.G. Hamed).
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of patients (1). With the development of health care reform, patients' care has been the major focus of most discussions, and this may be due to the need to reinforce strategies whereby care is of benefit to patients and to enhance a more fulfilling practice among health care providers (2). Quality improvement is a formal process to examine and improve performance through the analysis of data. The primary goal of quality improvement is to enhance patients' care (3). Quality improvement activities in nuclear medicine departments should emphasize the accuracy and efficiency of patients' care, patients and staff safety, and the patient's experience during care (4). Patients' satisfaction can be defined as a subjective concept aimed to relate the grade at which health care responds to the expectations of the patient or community. Also it is a multidimensional affected by thoughts or even previous experiences which make its measurements and comprehension difficult as an isolated concept (5). In order for the information provided to patients to be effective, it must be provided in a format that is easily understood by the patient (or accompanying person if the patient is not capable of understanding). The level of information should be appropriate to the hazard presented. Hospital nuclear medicine departments are known to produce very varied instructions to patients (6). We use Satisfaction questionnaires as a tool to evaluate whether the management of the department and the efforts made obtain a good result (7), and we aim this study to assess quality of care and patients' satisfaction in the nuclear medicine department in El-Ahrare Hospital-Egypt.

2. Subjects and methods

It is a cross sectional descriptive study that was performed in nuclear medicine department at El-El-Ahrare Hospital in Sharqia Governorate-Egypt from September to December 2012.

A designed questionnaire was used to assess patients' satisfaction about the services introduced in the nuclear medicine department. To assess the patients' satisfaction with outpatient services we used questionnaire that was quoted from NHS (8). The questionnaire was given to patients to fill it after having been in the Department of Nuclear Medicine during the period of the study. A total of 400 questionnaires were distributed; 240 questionnaires were answered by the patients themselves while illiterates were assessed by a social service officer in the hospital who was blinded to the objective of the study and not a member of the nuclear medicine staff and the rest of the questionnaire was either refused to be answered by the patients (100 questionnaires) or did not complete it (60 questionnaires). The response rate was 60%. The questionnaire consists of 25 questions (Appendix A) distributed as follows:

- Socio-demographic characters and health status of the patients: it included the 1st three questions (age, gender and education) and the 4th question was about heath status of the patients.
- Three questions asked about issues before consultation include: waiting time from the time of the appointment was requested until the test was performed, giving an option to choose the appointment based on needs of the patient and providing the patient with information regarding the examination or treatment to be received in the nuclear medicine department.
- Four questions were asked about the nuclear medicine department including: easy to find the department of Nuclear medicine on arrival to the hospital, the degree of the politeness with which you were attend in the department, the time of waiting from the time of the appointment till attendance & if the patient was told about the waiting time.
- Six questions were asked about comfort including: availability of free seats, comfort of the seats; suitability of the temperature and the noise in waiting room, cleanliness of the department and toilet.
- Six questions were asked about professionals including: giving you information about the test and if there was any different information given from other professional, opportunity to ask questions about the test, ensure the confidentiality of the information, respect your privacy during the doing test, identification of the name and professional category of the professional attending to you.
- Two questions were asked about overall impression of the service including: the general satisfaction and if the patient will recommend the department of the nuclear medicine to another patient.

2.1. Scoring of the questionnaire

Socio-demographic section in the questionnaire, was scored as follows: gender (0 = male, 1 = female), education (0 = illiterate, 1 = primary education, 2 = diploma. 3 = high education), health status (0 = suffering from difficult in performing daily activity, 1 = no difficulty in performing daily activity). All other questions were scored as 0 = non satisfied, 1 = satisfied.

2.2. Analysis of data

The statistical package *SPSS10.0* for Windows XP was used to perform the statistical analysis. *Chi square* X^2 was used to compare the proportions. As the last two questions are the best questions summarizing the objective of the study nominal regression was calculated to measure which variables best explained the variability in satisfaction with and recommendation of the department. The results obtained for satisfaction with the department were 0.74 for the Cox and *Snell coefficient* and 0.99 for *Nagelkerke and McFadden*. The results for recommending the department to others were 0.73 for the Cox and Snell collection and 0.98 for *Nagelkerke and McFadden*. Confidence interval was calculated at 95%.

3. Result

The majority of the study samples were female; 53.2% male; 46.8% with mean of age 46.5 ± 11.7. An analysis of the education level of the sample revealed 23.2% of the sample to be highly educated, 23.2% diploma, 22% primary educated and about 31.6% illiterate. About fifty-eight percent (58.4%) of the patients suffered from difficulty in performing daily life activities. The gender, the health status and level of the education of the studied sample were significantly affecting their general satisfaction of the nuclear medicine department (Table 1).

In the analysis of the association of the socio demographic variables and recommendations of the nuclear medicine

Table 1 Relation between patients' general satisfaction and their sociodemographic data and their health status.

	General satisfaction		Chi square	*P* value
	Not satisfied	Satisfied		
Gender				
Male	63 (53.8)	54 (46.2)	4.39	0.036*
Female	54 (40.6)	79 (59.4)		
Age				
<46.5	64 (47.1)	72 (52.9)	0.01	0.9
⩾46.5	53 (46.5)	61 (53.5)		
Health status				
No difficult in performing life activity	61 (58.7)	43 (41.3)	10.05	0.001*
Difficulty in performing life activity	56 (47.1)	90 (61.6)		
Level of education				
Illiterate	49 (62.0)	30 (38.0)	52.36	0.00*
Primary education	17 (30.9)	38 (69.1)		
Diploma	18 (31.0)	40 (69.1)		
High education	33 (56.9)	25 (43.1)		

department to others, there is a statistically significant difference in the gender and the level of the education of the studied sample (Table 2).

In the analysis of the percentage of dissatisfaction for the overall questionnaire (Table 3), it was found that questions about the informed waiting time Q11, information before examination Q7, noise in the department Q17, cleanliness of the department Q15, waiting time to appointment Q5 and conflict of information Q22 were found to have the highest percentage (Fig. 1).

The variables statistically affecting the general satisfaction were cleanliness of the nuclear medicine department, giving options in choosing the appointment, giving information before appointment regarding the examination or the treatment, waiting time from the time of the appointment was requested until the test was performed in nuclear medicine, politeness of persons of the department & being informed about waiting time as shown in Table 4.

The variables which statistically affected recommendation of the nuclear medicine department to the others were giving options in choosing the appointment, waiting time from the time of the appointment was requested until the test was performed in the nuclear medicine department, clean toilets, giving information before appointment regarding the examination or the treatment, conflict of information, cleanliness & noise in the department as shown in Table 5.

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4. Discussion

Satisfaction is a multi-dimensional concept influenced by preconceived thoughts or even previous experiences which make its measurements and comprehension difficult as an isolated

Table 2 Relation between patients' recommended the department of Nuclear Medicine their sociodemographic data and their health status.

	Recommend the nuclear department		Chi square (X^2)	*P* value
	Yes No (%)	No No (%)		
Gender				
Male	54 (46.2)	63 (53.8)	11.8	0.00*
Female	90 (67.7)	43 (32.3)		
Age				
<46.5	83 (61.0)	53 (39.0)	1.44	0.9
⩾46.5	61 (53.5)	53 (46.5)		
Health status				
No difficult in performing life activity	55 (52.9)	49 (47.1)	1.62	0.2
Difficulty in performing life activity	89(61.0)	57(39.0)		
Level of education				
Illiterate	29 (36.7)	50 (63.3)	21.1	0.00*
Primary education	38 (69.1)	17 (30.9)		
Diploma	40 (69.0)	18 (31.0)		
High education	37 (63.8)	21 (36.2)		

Table 3 Percentages of dissatisfaction in questionnaire.

	% Of dissatisfaction per patient	No of patients	% Of dissatisfaction to total
Waiting time to appointment Q5	49.6	124	7.04
Option for appointment Q6	42.0	105	6.0
Information before examination Q7	59.6	149	8.5
Easy to find the department Q8	21.2	53	3.0
Politeness of person' s department Q9	26.4	66	3.74
Waiting time Q10	37.2	93	5.3
Informed about waiting time Q11	64.8	162	9.2
Free seats available Q12	0.4	1	0.05
Comfortable seats Q13	17.6	44	2.5
Right temperature in waiting room Q14	20.4	51	2.9
Clean department Q15	50.4	126	7.2
Clean toilets Q16	47.8	118	6.1
Noise in department Q17	50.8	127	7.2
Given information about test Q18	34.4	86	4.9
Opportunity to ask questions Q19	35.2	88	5
Confidentiality of information Q20	22.8	57	3.2
Privacy of test Q21	34.0	85	4.8
Conflict of information Q22	49.6	124	7.04
Identification of doctors Q23	40.8	102	5.9

*Underline values had high percentage of dissatisfaction.

Table 4 Result of nominal regression with general satisfaction.

Variable	Wald	*P* value
Cleaning of the nuclear medicine department	83.929	0.00
Giving options in choosing the appointment	68.889	0.00
Giving information before appointment regarding the examination or the treatment	62.961	0.00
Waiting time from the time of the appointment was requested until the test was performed in nuclear medicine	29.627	0.00
Politeness of department personnel	25.792	0.00
Informed about waiting time	7.509	0.00

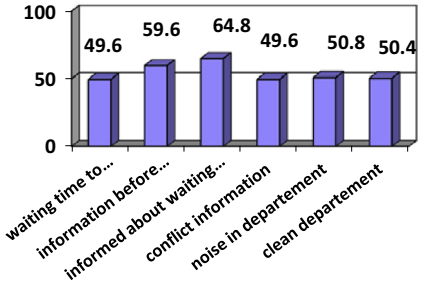

Fig. 1 Percentage of patients' dissatisfaction.

concept. Measurement of satisfaction is part of a concept which is difficult to quantify and even define. Many authors define it as a subjective concept aimed at relating the grade at which health care responds to the expectations of the patient or community (8). Satisfaction questionnaires in patients receiving health care are useful tools when evaluating whether the management of the department and the efforts made obtain a good result (9). Different studies have found a strong association between the perception of the global quality of a department and the satisfaction of the patients (9–11).

Table 5 Result of nominal regression with recommendation of the department to others.

Variable	Wald	*P* value
Giving options in choosing the appointment	85.371	0.00
Waiting time from the time of the appointment was requested until the test was performed in nuclear medicine	45.199	0.00
Clean toilets	44.330	0.00
Giving information before appointment regarding the examination or the treatment	41.453	0.00
Conflict of information	39.991	0.00
Clean department	39.941	0.00
Noise in department	38.129	0.00
Identification of doctors	29.095	0.00
Politeness of person's department	25.847	0.00

In our study the socio-demographic characteristics of participants showed that most of them were females (53.2%) with mean age of 46.5 ± 11.7. This result agrees with *Caminal's study* (6) which reported that 58% of those surveyed were women. The mean age of patients was 56.5 (±16.26). Most of the study samples were illiterate (31.6%) and 22% primary educated which is compatible with the level of education in Egypt, whereas 23.2% of the sample are highly educated and 23.2% had diploma.

In the analysis of the health status of the study sample, it was found that 58.4% were suffering from difficulty in performing daily life activity and this may be explained as most of the cases in the nuclear medicine department had malignancy or chronic renal or cardiac diseases. The result of our study is comparable to Vicente et al. study (7), who reported that 35.2% of their sample had difficulty in performing daily life activity. The socio-demographic characteristics (gender, level of the education and health status) significantly affect the overall impression on the nuclear medicine department. Gender and level of the education only significantly affect the recommendation of the department to the others and this agrees with Andrés et al. (12), while it was controversial with

Perez et al. study (9), who reported that socio-demographic characteristics did not affect the overall impression or recommendation of the department to the others.

The results of our study showed that social aspects like giving information about waiting time, information before examination and conflict information were unsatisfactory to the patients. This explained by low level of education of most the patients and many procedures of nuclear medicine includes many steps as some cases of bone scan required dynamic images or blood pool scan prior to the whole body scan performed 2–4 h after IV injection of the radiotracer and needs static spot views which delayed the next patient, the protocol of the cardiac scan includes rest and stress phases and some cases of the renal scan required delayed images or Tc99m DMSA scan on the next day.

Reception of the patients on arrival will affect their satisfaction since the successful application of medical knowledge depends on the patients' perception of hospital personnel and the hospital itself, radiodiagnostic services found that adequate explanation and instruction to the patient about the procedure before the examination that is carried out is necessary since it significantly contributes to obtaining a good diagnostic image (13). In our study, patients were not satisfied with the degree of cleanliness and noise in the department and these results agree with Okaro et al. study (14), who reported that the waiting areas were recognized as uncomfortable by 83.7% of the study population. In our study the waiting time from the time of the appointment was requested until the test was performed in nuclear medicine or the length of the waiting time greatly affected satisfaction of the patients and this agrees with many of studies (15) which consider waiting time as an important parameter in affecting the satisfaction of health care user.

5. Recommendation

Patients' satisfaction is greatly affected by many factors which can be improved by the nuclear medicine department staff as waiting time, cleanliness of the department and most these factors can be refined by improving the system of booking and registration and training the department staff to simplify the nuclear medicine procedure to the patient and prepare them for any unexpected changes in the time schedule.

Conflict of interest

The authors have no conflict of interest to declare.

Appendix I

Questionnaire for measuring patients' satisfaction
Sex: male female.
Age:
Education:
Illiterate primary education diploma high education.
Description of your health status:
Suffering from difficulty in performing daily activity – no difficulty in performing daily activity.

Before the consultation
Are you satisfied with the waiting time from the time of the appointment was requested until the test was performed in nuclear medicine department?
Not satisfied satisfied

Giving an option in the appointment date so that you could choose the appointment based:
Not satisfied satisfied

Before your appointment were you provided with information regarding the examination or treatment you were to receive in nuclear medicine?
Not satisfied satisfied

Nuclear medicine

On arrival to the hospital was it easy to find the Department of nuclear medicine?
Not satisfied satisfied

Once you were in the Department of Nuclear Medicine how would you rate the politeness with which you were attended in the department?
Not satisfied satisfied

Waiting time from the time of the appointment until you were actually attended?
Not satisfied satisfied

The Department of Nuclear Medicine, were you told how long should you wait?
Not satisfied satisfied

Comfort (no = not satisfied yes = satisfied)

Were there free seats for you and your companion in the waiting room?
No yes

Were the seats in the waiting room comfortable?
No yes

Appendix I (*continued*)

Had the waiting room the right temperature for you?	
No	yes
In your opinion, was the Department of Nuclear Medicine clean?	
No	yes
In your opinion, were the toilets clean?	
No	yes
Was the Department of Nuclear Medicine quiet and devoid of noise that disturbs you?	
No	yes
Professionals	
Were you satisfied with the given information about the tests or the ongoing treatment?	
Not satisfied	satisfied
Did you have the opportunity to ask questions about the test or treatment?	
No	yes
Are you satisfied with the confidentiality of the information when you were informed about the test or treatment?	
Not satisfied	satisfied
During the test or treatment was your privacy respected as far as possible	
No	yes
Was the information given to you clear and the same from all the staff of the department	
No	yes
Were the professionals that attended you correctly identified (name, professional category)?	
No	yes
Overall impression of the service	
What is your overall impression of the organization of the Nuclear Medicine Department?	
Not satisfied	satisfied
Are you satisfied and would you recommend the Department of Nuclear Medicine to another patient if this person were in the same clinical condition	
Not satisfied	satisfied

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